

REMARKS

1. The Examiner has made final the restriction requirement mailed on October 9, 2002 (Paper No. 4), the requirement also restated in the paper mailed on January 23, 2003. Traverse is maintained on the restriction requirement, at least on the grounds previously mentioned, in that examination is required of all members of a Markush group, if the number is sufficiently small. M.P.E.P. 803.02. The Examiner is requested to remove at least the species restriction and examine Claims 1-13 and 20. Species I concerns the species depicted in Fig. 4, a two-pass downflow condenser drawn to Claims 1-6 and 20, while Species II concerns the species depicted in Fig. 9, a four-pass downflow condenser drawn to Claims 7-13. As noted by the Examiner in the restriction requirement (Paper No. 4), Claims 3 and 9 are generic, and if allowed, a reasonable number of species may also be allowable.

The rationale for restriction requirements is that there is too great a burden on the Examiner to examine all the claims presented in an application. Even if there are separate and distinct inventions in an application, if the search and examination of an entire application can be made without serious burden, the Examiner must examine it on the merits. M.P.E.P. 803 (Restriction – when proper; emphasis added). The references cited by the Examiner in the rejections of Claims 1-6 include multipass heat exchangers, including U.S. Pats. No. 2,004,390, 4,141,409 (Woodhull, Jr. et al.), 4,877,083 (Saperstein et al.), 5,537,839 (Burk et al.), and 5,709,106 (Inaba et al.). The search conducted by the Examiner therefore encompassed multipass heat exchangers, and also encompassed the Species I two-pass condenser depicted in Fig. 4, because rejections in the present application are based on these references.

Having conducted a search that encompasses multipass heat exchangers, as in Species II, there is clearly no burden to examine at least Claims 7-13 and 20, as well as examined Claims 1-6, as per Species I. The search has been conducted, and it would seem reasonable, under M.P.E.P. 803, to at least examine the claims which the search covers. The Examiner is respectfully requested to withdraw the finality of the restriction requirement, and to withdraw at least the species restriction requirement, and to examine Claims 7-13 and 20.

2. The Examiner has proceeded to examination on the merits, and has rejected Claims 1-3 and 5-6 under 35 U.S.C. § 102(b) as being anticipated separately by five patents, discussed

below. Regarding all five rejections under § 102(b), the Office Action also states that the “wherein” clause is considered to be functional language bearing no patentable weight in this instance. The Office Action cites M.P.E.P. 2114 for support. This paragraph pertains to the use of functional language in apparatus and article claims, and states that claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. The Office Action also cites *Ex Parte Masham*, 2 U.S.P.Q.2d 1647 (BPAI 1987), for the proposition that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Taken together, Applicants believe that these sources require a claimed invention to distinguish itself over the prior art in structure rather than mere function.

This does not mean, however, that “wherein” clauses cannot contain structure. Applicants traverse the assertion in the rejections under § 102(b) that the wherein clause is considered to be functional language. The Office Action cites no authority for this assertion. There are several “wherein” clauses in Claim 1 and the dependent claims that describe structural limitations. These include further limitations for the lower horizontal manifold and for the at least one second tube. The limitations in the final wherein clause define further limitations for the structural components of the downflow condenser claimed.

The limitations recited in the present application are not the purely functional limitations recited in the rejection of *Masham*, in which the rejection was for an old apparatus, and the point of novelty was simply that the material being processed was “completely submerged in the developer material.” *Id.* at 1648. Furthermore, there are many cases of record in which “wherein” clauses with structure are given effect by the Board of Patent Appeals and Interferences (BPAI) and by the courts. These cases include: *Griffin v. Bertina*, 62 U.S.P.Q.2d 1431, 1434 (Fed. Cir. 2002) (affirming claim construction by the BPAI that included a structural wherein clause); *Ishida Co. v. Taylor*, 55 U.S.P.Q.2d 1449, 1451, 1453 (Fed. Cir. 2000) (affirming claim construction by a district court of a structural wherein clause); and *Johns Hopkins Univ. v. Cellpro Inc.*, 47 U.S.P.Q.2d 1705, 1708, 1717 (Fed. Cir. 1998) (affirming claim construction by a district court of a structural wherein clause).

Accordingly, because the “wherein” clauses in the claims of the present application further define structural elements within the claims, the Examiner is respectfully requested to examine and give weight to the “wherein” clauses.

3. The Examiner has rejected Claims 1-3 and 6 under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 2,004,390 to Julius Benzinger ("Benzinger"). The rejection states that it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the apparatus from a prior art apparatus satisfying the claimed structural limitations, citing *Ex parte Masham*, 2 U.S.P.Q.2d 1647 (BPAI 1987). The rejection states that with respect to the recitation of horizontal manifolds, orienting the device of Benzinger 90° will read exactly on the claim. The rejection does not point to any particular figure or passage in Benzinger, which does indeed deal with horizontal flow in a heat exchanger rather than the claimed downflow condenser of the present application.

The rejection of Claims 1-3 and 6 as anticipated by Benzinger is traversed. Turning Benzinger 90° does not result in the claimed downward condenser. Benzinger's heat exchanger is designed to work with horizontal flow, not vertical flow. The invention as claimed seeks to maximize the flow of vapor around the tubes in the first pass ("at least one first tube having a first end and a second end, connected at the first end to the near end of the upper manifold"). Therefore, the claim includes "a lower baffle in the lower manifold, separating the near end and the far end of the lower manifold." The claim also recites "the lower baffle in the lower manifold allows only liquid to enter the second pass, and the liquid enters the second pass and leaves through the far end of the upper manifold." As also claimed, the liquid cannot rise to cover the tubes in the first pass, because the liquid will flow from the first pass to the second pass before it rises in the first pass. To summarize, the downflow condenser of Claims 1-3 and 6 separates vapor from liquid and does not allow liquid to submerge the tubes ("at least one first tube" and "at least one second tube").

Benzinger, on the other hand, does not separate liquid from vapor in each pass, and is directed to an entirely different apparatus in which some tubes in at least the first pass are expected to be flooded. Benzinger's heat exchanger is designed to work with horizontal flow, not vertical flow. Note that in Fig. 1 of Benzinger, and as explained on page 2, first column, liquid entering inlet 21 and condensate forming in the first pass drops into space 27 at the end of the pass. The liquid and the condensate accumulate to the level of dam plate 16 and dam edge 29, flooding all the tubes of the first pass below that level. If one turns Benzinger 90°, and ignoring any difficulty in the direction of the inlet connection, the dam plate 16 is now

perpendicular to the tubes 10, not parallel. If it is argued that separator 23 acts as a dam, attention is directed to the remainder of Fig. 1. The liquid in Benzinger can only be removed through drain ports 17, while in the claimed invention, “liquid enters the second pass and leaves through the far end of the upper manifold.” Figs. 3 and 7 also do not anticipate Claims 1-6.

Benzinger differs specifically from Claim 1 in that Benzinger does not describe or suggest a downflow condenser, but rather a horizontal heat exchanger. In a condenser, as opposed to a heat exchanger, there is an expectation that all the hot gas entering will be condensed into a liquid, and that therefore much more liquid must be handled in a condenser than in a heat exchanger. There are numerous other differences. Benzinger works in a horizontal direction, and does not describe or suggest “an upper horizontal manifold,” or “a lower horizontal manifold” as claimed. Claim 1 requires a structural limitation, not met by Benzinger, that “the lower manifold, the at least one second tube and the upper manifold are in a vertical relationship.” Benzinger also does not meet the structural limitation that “the lower baffle in the lower manifold allows only liquid to enter the second pass.”

In addition to these limitations missing from Claim 1, Benzinger also does not describe or suggest many of the limitations of dependent Claims 2, 3, and 6. Benzinger does not describe an inlet connected to a near end of an upper horizontal manifold or an outlet connected to a far end of an upper horizontal manifold, as claimed in Claim 2. Benzinger does not describe or suggest a lower baffle that is selected from the group consisting of a depressed portion, a leak path, and a bypass baffle, as claimed in Claim 3. Benzinger does not describe or suggest a dyer as claimed in Claim 4, extended surfaces as claimed in Claim 5, or a nondiscrete refrigerant tube as described in the application and as claimed in Claim 6. Accordingly, Benzinger does not describe or suggest the invention claimed in Claims 1-3 and 6, and the Examiner is respectfully requested to withdraw the rejection. Claim 1 has nevertheless been amended, to make it clearer that the claimed upper horizontal manifold and the lower horizontal manifold are in the claimed vertical relationship by further describing the fluid flow from the upper horizontal manifold to the lower horizontal manifold as flow induced by gravity. Because the claimed condenser is already claimed as a “downflow” condenser, and the horizontal manifolds have been claimed as being in a vertical relationship, the amendment is not a narrowing amendment under *Festo*. *Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (*en banc*), *overruled in part*, 535 U.S. 722, 62 U.S.P.Q. 1705 (2002).

4. The Office Action also rejects Claims 1-3 and 5-6 under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 4,141,409 to Ivan Woodhull, Jr., et al. ("Woodhull"). The rejection does not specify a figure or passage of Woodhull. Woodhull is directed to horizontal condensing tubes 20 as shown in Fig. 1. Woodhull's condenser is designed to work with horizontal flow, not vertical gravity flow, as in amended Claim 1. There is no lower baffle to separate the tubes of the first pass 80 of Woodhull from the tubes of the second pass 82. Even if one were to simply stand Woodhull's apparatus on its side, and use the condenser in a vertical manner, the condenser would not work because the weepholes 73 would not allow fluid to flow in sufficient quantity to empty the heat exchanger, because "bores 73 are of a size which allows the condensed liquid to flow therethrough by capillary action." Col. 3, lines 46-47. Therefore, Woodhull must be approached as it is presented, a horizontal, multi-pass apparatus.

Woodhull does not describe or suggest a number of the limitations of the claimed inventions. Woodhull does not describe or suggest an upper horizontal manifold, nor a lower horizontal manifold. Woodhull does not describe or suggest an arrangement in which "the lower manifold, the at least one second tube, and the upper manifold are in a vertical relationship." Woodhull does not describe or suggest a downflow condenser in which "the lower baffle in the lower manifold allows only liquid to enter the second pass." In addition to these limitations, Woodhull similarly does not describe or suggest many of the limitations of the dependent claims, as discussed above for Benzinger, such as an outlet connected to the far end of the upper horizontal manifold, a dryer, or a nondiscrete refrigerant tube. Accordingly, Woodhull does not describe or suggest the invention claimed in Claims 1-3 and 5-6, and the Examiner is respectfully requested to withdraw the rejection under 35 U.S.C. § 102(b).

5. The Office Action also rejects Claims 1-2 and 5-6 under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 4,877,083 to Z. Saperstein ("Saperstein"). The rejection does not point to any figure or detail in Saperstein, which is directed to a method of brazing heat exchangers, and to the heat exchangers themselves. The baffles in Saperstein are very specific in that they occupy all the space in the headers, except for a notch which is later filled with braze material. Each baffle has "a first or exterior peripheral section 36 which is typically semicircular having a radius indicated by the arrow 38 which in turn is equal to the half of the outer diameter of the corresponding header 10 or 12 . . . the remainder of the periphery of the baffle is a second

semicircular section 40 having a lesser radius shown by the arrow 42 which is turn is equal to one half of the inner diameter of the corresponding header 10a or 12.” Col. 4, lines 3-13.

Thus, the baffle has an outer diameter to match the slot in the header, and an inner diameter to match the inner diameter of the header, completely filling the header. With the notch filled with braze material, there is no path for fluid to flow horizontally in each header, and as indicated in Fig. 1 of Saperstein, all flow is vertical. Therefore, Saperstein does not disclose or suggest a lower baffle in the lower manifold, wherein the lower baffle in the lower manifold allows only liquid to enter the second pass. This is a structural limitation, because the baffle claimed in Claim 1 is not a complete barrier, but “allows only liquid to enter the second pass,” as claimed. The Saperstein reference does not disclose or suggest at least this limitation of Claim 1. Saperstein also does not describe or suggest many of the limitations of the dependent claims, as discussed above, such as a dryer and nondiscrete refrigerant tubes. The Examiner is respectfully requested to withdraw the rejection of Claims 1-2 and 5-6 under 35 U.S.C. § 102(b) over Saperstein.

6. The Office Action also rejects Claims 1-3 and 5-6 under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,186,249 to Mohinder Bhatti et al. (“Bhatti”). The rejection does not point to any particular figure or passage in Bhatti. Bhatti is directed to a heater core, taking in hot fluid and transferring heat to another fluid through flow tubes 45, such as air for a car’s passenger compartment. Therefore, Bhatti does not describe or suggest the threshold requirement that is specifically mentioned in Claim 1 and in each dependent claim: a condenser, and specifically a downflow condenser. As is well known in heat exchange arts, a condenser is used to change a gas to a liquid, or to at least partially change a gas to a liquid. Bhatti does not describe or suggest condensation of any sort, and therefore does not describe or suggest all the limitations of the claimed invention. The Examiner is respectfully requested to withdraw the rejection of Claims 1-3 and 5-6 under 35 U.S.C. § 102(b) per the Bhatti reference.

7. The Office Action rejects Claims 1-3 and 5-6 under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 5,709,106 to Hiroyuki Inaba et al. (“Inaba”). The Office Action indicates that Fig. 7 is the appropriate point of Inaba. Inaba is directed to a condenser with a liquid tank, with most of the embodiments directed to condensers with horizontal arrangements, as shown at least

in Figs. 1-4 and 14-19. Fig. 7 depicts vertical flow upward and downward. The accompanying text, at cols. 10-11, under the heading, "3rd Embodiment," does not describe or suggest at least one limitation of Claim 1 and the claims depending from Claim 1, that of a lower baffle, separating the near end and the far end of the lower manifold, the lower baffle allowing only liquid to enter the second pass of the downflow condenser.

Fig. 7 and the accompany text describe no lower baffle. Other passages in Inaba refer to portioning walls 27, 30a and 30b, as depicted in Figs. 2 and 3. However, there is no teaching or indication that the portioning walls in Inaba are constructed as claimed in Claim 1 and its dependent claims. The walls of Inaba do not describe or suggest the separation of liquid from gas, each pass of Inaba allowing both gas and liquid to pass through to the next pass of the heat exchanger. Accordingly, Inaba does not describe a lower baffle that allows only liquid to enter the second pass of the downflow condenser. Inaba also does not describe or suggest the limitations found in the dependent Claims 2-3 and 5-6, such as a lower baffle, a dryer, or a nondiscrete refrigerant tube. The Examiner is respectfully requested to withdraw the rejection of Claims 1-3 and 5-6 under 35 U.S.C. § 102(b) per Inaba.

8. The Office Action also rejects Claim 4 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 5,709,106 to Hiroyuki Inaba et al. ("Inaba") in view of U.S. Pat. No. 5,537,839 to Roland Burk et al. ("Burk"). The rejection states that Inaba discloses all the limitations of the claimed invention except for an internal dryer, but that Burk discloses an internal dryer 32 for the purpose of optimizing space requirements. The rejection states that it would have been obvious to one having ordinary skill in the art to employ in a heat exchanger according to Inaba an internal dryer for the purpose of optimizing space requirements as recognized by Burk. The rejection further states that Inaba and Burk are from the same field of endeavor and that the purpose disclosed by Burk would have been recognized in the pertinent art of Inaba.

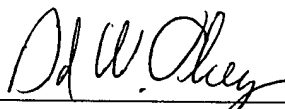
Applicants traverse the rejection of Claim 4. The Examiner has not given any motivation that is sufficient for combining the references. Even combined, the references do not disclose or suggest all the limitations of the invention claimed in Claim 4. In order to combine references, the prior art must suggest the desirability of the claimed invention. M.P.E.P. 2143.01 at 2100-125. The Examiner has cited no passage from Inaba that a dryer is needed. Inaba

simply states that the liquid refrigerant tanks are manufactured separately from the condenser and that it would be desirable to integrate a liquid refrigerant tank with a condenser. Col. 1, lines 36-44 and col. 3, lines 65-67. Inaba does not mention or suggest the desirability of a drier as claimed in Claim 4. Burk is silent on any such motivation.

Therefore, the Office Action has not made out a *prima facie* case of obviousness for the combination of Burk and Inaba because there is no suggestion in the prior art of the desirability of combining the references. In addition, as pointed out in the discussions above concerning the § 102(b) rejections, the other references do not describe or suggest all the limitations of Claim 1 from which Claim 4 depends. Since even the improperly combined references do not describe or suggest all the limitations of the invention claimed in Claim 4, the Examiner is respectfully requested to withdraw the rejection of Claim 4 under 35 U.S.C. § 103(a) over Inaba in view of Burk.

9. The Examiner has made the restriction requirement final and has examined Claims 1-6. Applicants have traversed the rejections of Claims 1-6 under 35 U.S.C. §§ 102(b) and 103(a), and have argued against the rejections. Even if all other arguments fail, none of the references remotely describe or suggest the nondiscrete refrigerant tubes claimed in Claim 6. Claim 1 has been amended. Accordingly, the Examiner is respectfully requested to enter the amendment, to withdraw the restriction requirement, to withdraw the rejections and to allow Claims 1-6.

Respectfully submitted,



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